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**Reese et al.**

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(54) **ONE OR MORE DOORS WITH ONE OR MORE ANGLED SIDE FLANGES FOR ELECTRICAL PANEL ENCLOSURE**

(2013.01); **H02B 1/38** (2013.01); **H05K 5/0226** (2013.01); **H02B 1/28** (2013.01)

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CPC .. H02B 1/38; H02B 1/28; E05B 65/02; E05C 9/04; E06B 7/22; H05K 5/0226  
See application file for complete search history.

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(56) **References Cited**

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U.S. PATENT DOCUMENTS

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 276 days.

3,157,306	A *	11/1964	Courson	.....	F25D 21/04
					220/592.06
3,178,246	A *	4/1965	Riles	.....	A47B 47/03
					312/265.4
D210,078	S	2/1968	Eck		
4,940,299	A *	7/1990	Lazenby	.....	A47B 47/02
					312/285

(Continued)

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FOREIGN PATENT DOCUMENTS

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CN	201830589	U *	5/2011
CN	204168660	U *	2/2015

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OTHER PUBLICATIONS

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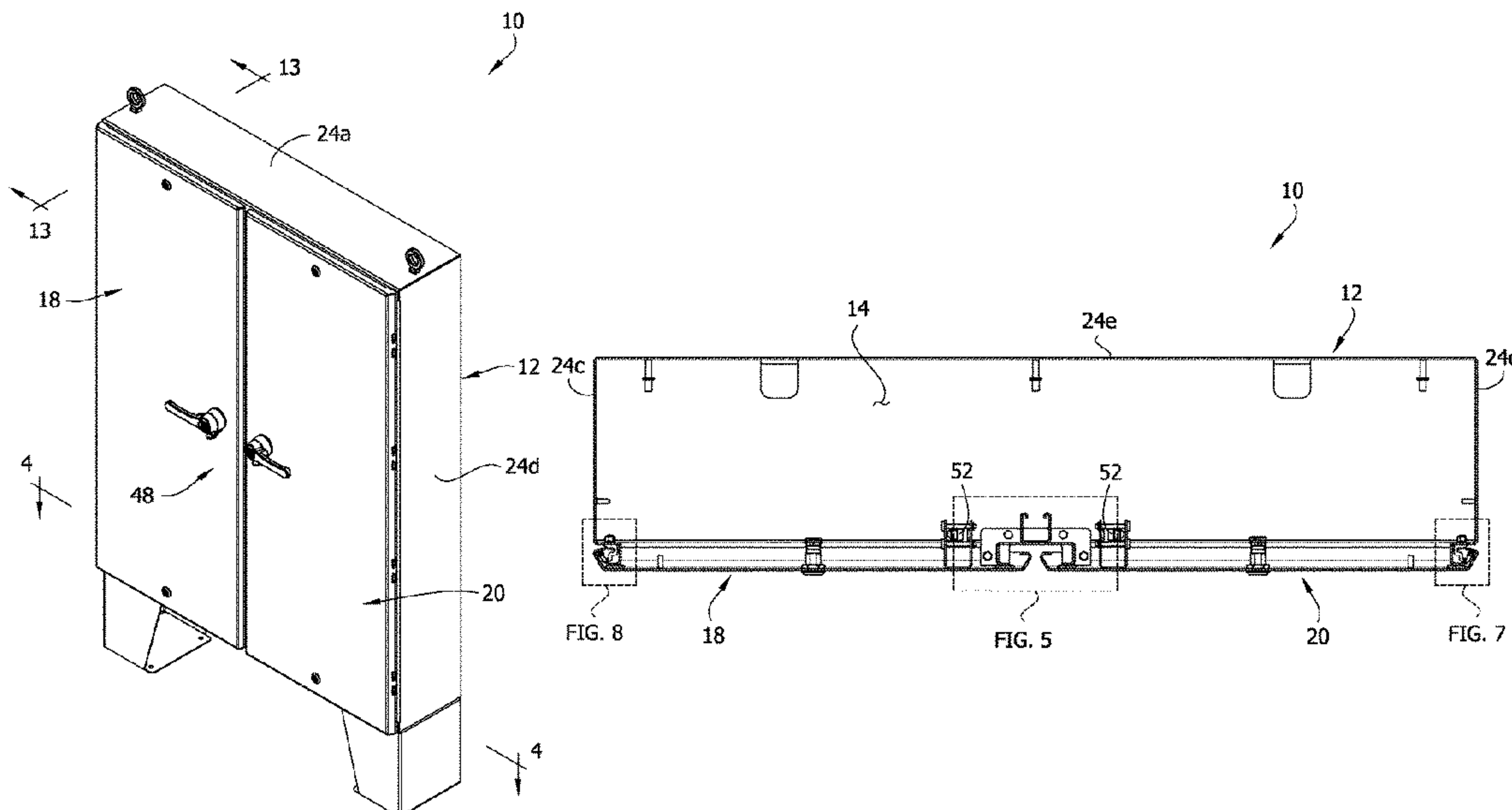
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**E06B 7/22** (2006.01)  
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(57) **ABSTRACT**

An electrical panel enclosure includes a door hingedly secured to an enclosure body at the front side of the enclosure body. The door includes a door panel having a planar door panel body with opposite first and second side edge margins, and a first side door flange extending rearwardly from the first side edge margin of the door panel body. The first side door flange extends at an angle greater than 90 degrees relative to the planar door panel body.

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**18 Claims, 22 Drawing Sheets**



(56)

References Cited

U.S. PATENT DOCUMENTS

5,056,577 A	10/1991	DeLong et al.					
D324,965 S	3/1992	Nelsen					
D349,888 S	8/1994	Yamamoto et al.					
5,347,778 A	9/1994	Bray					
5,467,250 A *	11/1995	Howard	H05K 7/206				
			165/122				
D365,086 S	12/1995	Spechts					
5,483,905 A *	1/1996	Johansson	A47B 81/00				
			109/79				
5,573,319 A *	11/1996	Dirk	H02B 1/50				
			174/520				
5,641,215 A *	6/1997	Pochet	E05B 65/0003				
			312/107.5				
5,822,180 A	10/1998	Deschamps et al.					
6,170,928 B1 *	1/2001	Eardley	E05B 17/0025				
			312/223.1				
6,445,585 B1	9/2002	Walker					
6,478,391 B1	11/2002	Stoever					
D479,883 S	9/2003	Gresham					
6,667,438 B2 *	12/2003	Schneider	H02B 7/06				
			16/221				
D503,931 S	4/2005	Kauranen et al.					
6,877,827 B2 *	4/2005	Holighaus	H02B 1/30				
			312/213				
D543,161 S	5/2007	Stepputat					
D588,081 S	3/2009	Lewis, II et al.					
D615,325 S	5/2010	Holcomb					
7,871,137 B2 *	1/2011	Schulz	H02B 1/28				
			312/296				
7,952,042 B2	5/2011	Coomer et al.					
D653,224 S	1/2012	Jonas et al.					
8,147,008 B2 *	4/2012	Guebre-Tsadik	E05B 65/0003				
			312/109				
D669,694 S	10/2012	Yoo et al.					
D670,510 S	11/2012	Daino et al.					
9,318,883 B2 *	4/2016	Schmidt	H02B 13/025				
9,780,537 B2 *	10/2017	Bonfanti	H02B 1/28				
D812,025 S	3/2018	Cagliani et al.					
				10,010,003 B2	6/2018	Chang et al.	
				D830,975 S	10/2018	Vierjarvi et al.	
				D857,639 S	8/2019	Reese et al.	
				10,537,038 B2	1/2020	Reese et al.	
				2003/0102141 A1 *	6/2003	Schneider	H02B 7/06
							174/50
				2004/0239215 A1	12/2004	Sargeant	
				2006/0243690 A1	11/2006	Mollard	
				2009/0052143 A1	2/2009	Chiu	
				2009/0173118 A1 *	7/2009	Schulz	H02B 1/28
							70/275
				2011/0001404 A1 *	1/2011	Lear	A47B 95/02
							312/213
				2011/0001411 A1	1/2011	Borning et al.	
				2011/0115345 A1	7/2011	Kang	
				2011/0181160 A1	7/2011	Peng et al.	
				2012/0062084 A1	3/2012	Lewis, II et al.	
				2012/0299455 A1	11/2012	Li et al.	
				2013/0320831 A1 *	12/2013	Schmidt	H02B 13/025
							312/296
				2013/0342091 A1	12/2013	Walker et al.	
				2014/0084766 A1 *	3/2014	Smith	H05K 5/0217
							312/292
				2014/0104759 A1	4/2014	Takano	
				2015/0002006 A1	1/2015	Segroves et al.	
				2015/0075080 A1 *	3/2015	Ellingson	E06L 37/2309
							49/483.1
				2015/0173253 A1	6/2015	Lewis, II et al.	
				2016/0219729 A1	7/2016	Omani et al.	
				2016/0255421 A1	9/2016	Farrar et al.	
				2016/0372896 A1	12/2016	Strong et al.	
				2017/0040778 A1 *	2/2017	Bonfanti	H02B 1/38
				2017/0150636 A1	5/2017	Segroves et al.	
				2017/0172015 A1	6/2017	Yu et al.	
				2018/0098456 A1	4/2018	Schreier et al.	
				2018/0139859 A1 *	5/2018	Reese	H02B 1/38
				2018/0213667 A1	7/2018	Midday et al.	
				2018/0213670 A1	7/2018	Freire	
				2018/0213673 A1	7/2018	Eckberg et al.	
				2018/0298654 A1 *	10/2018	Harder	E05C 9/04
				2019/0055752 A1 *	2/2019	Anderson	H02B 1/00

\* cited by examiner

FIG. 1

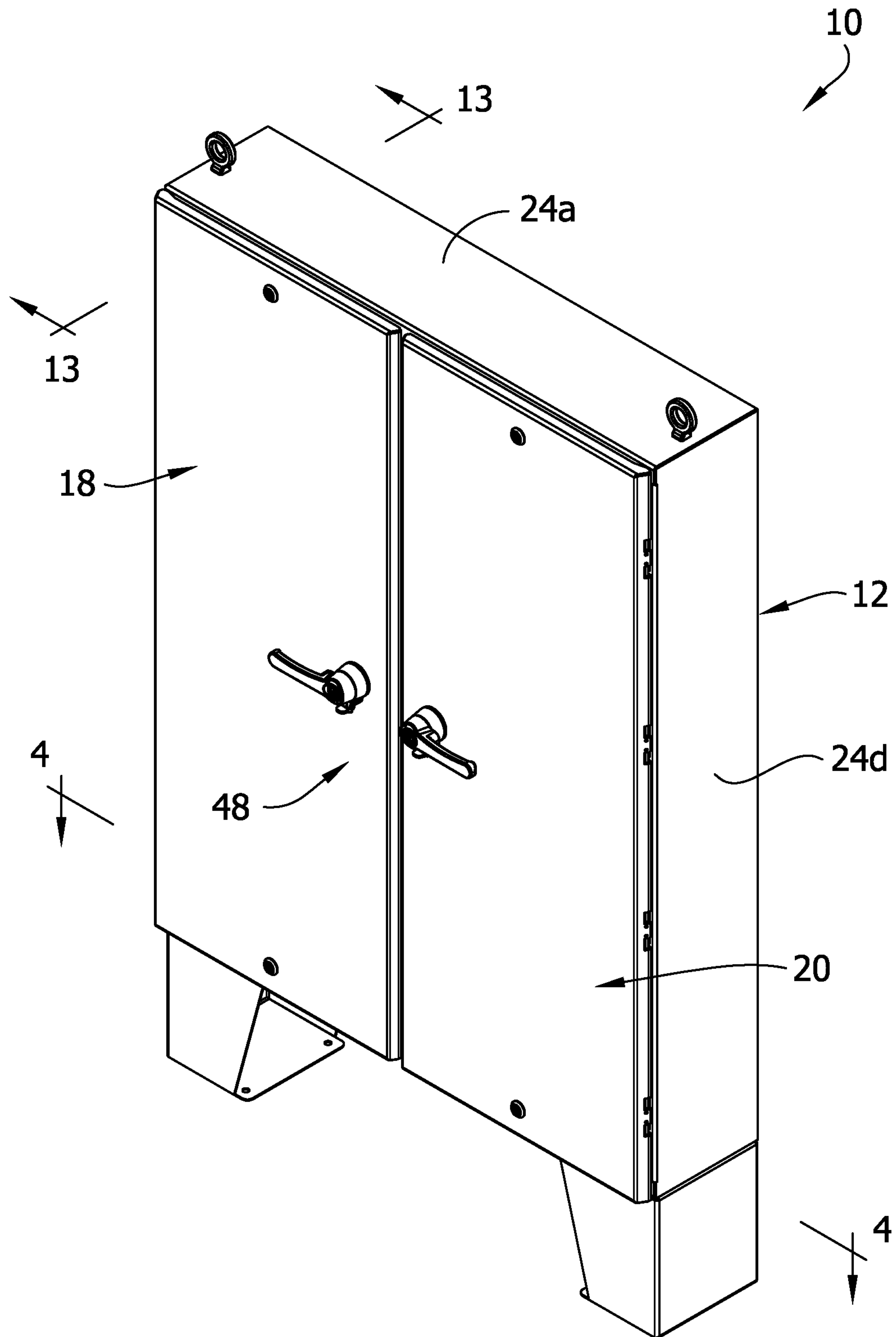


FIG. 2

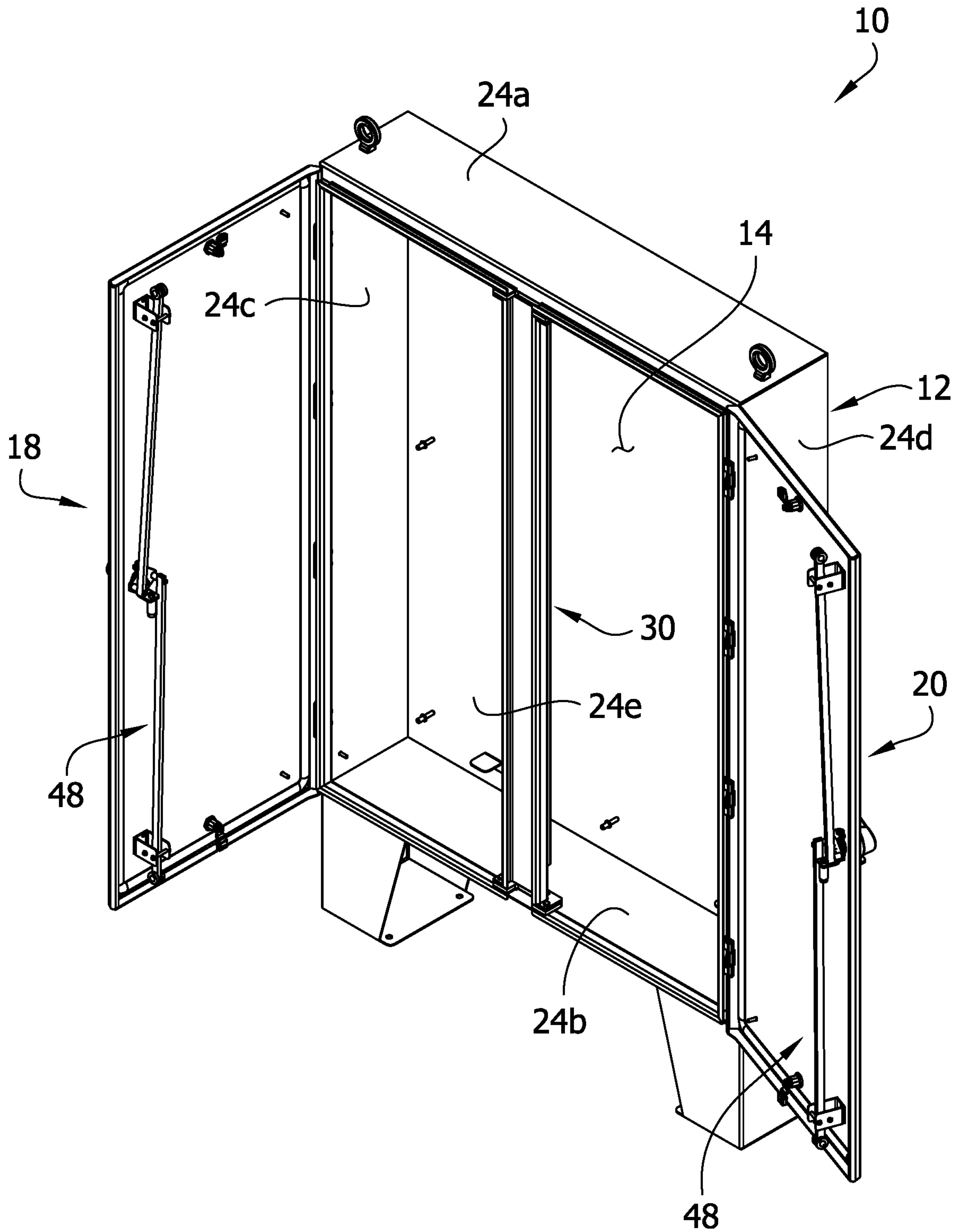






FIG. 4

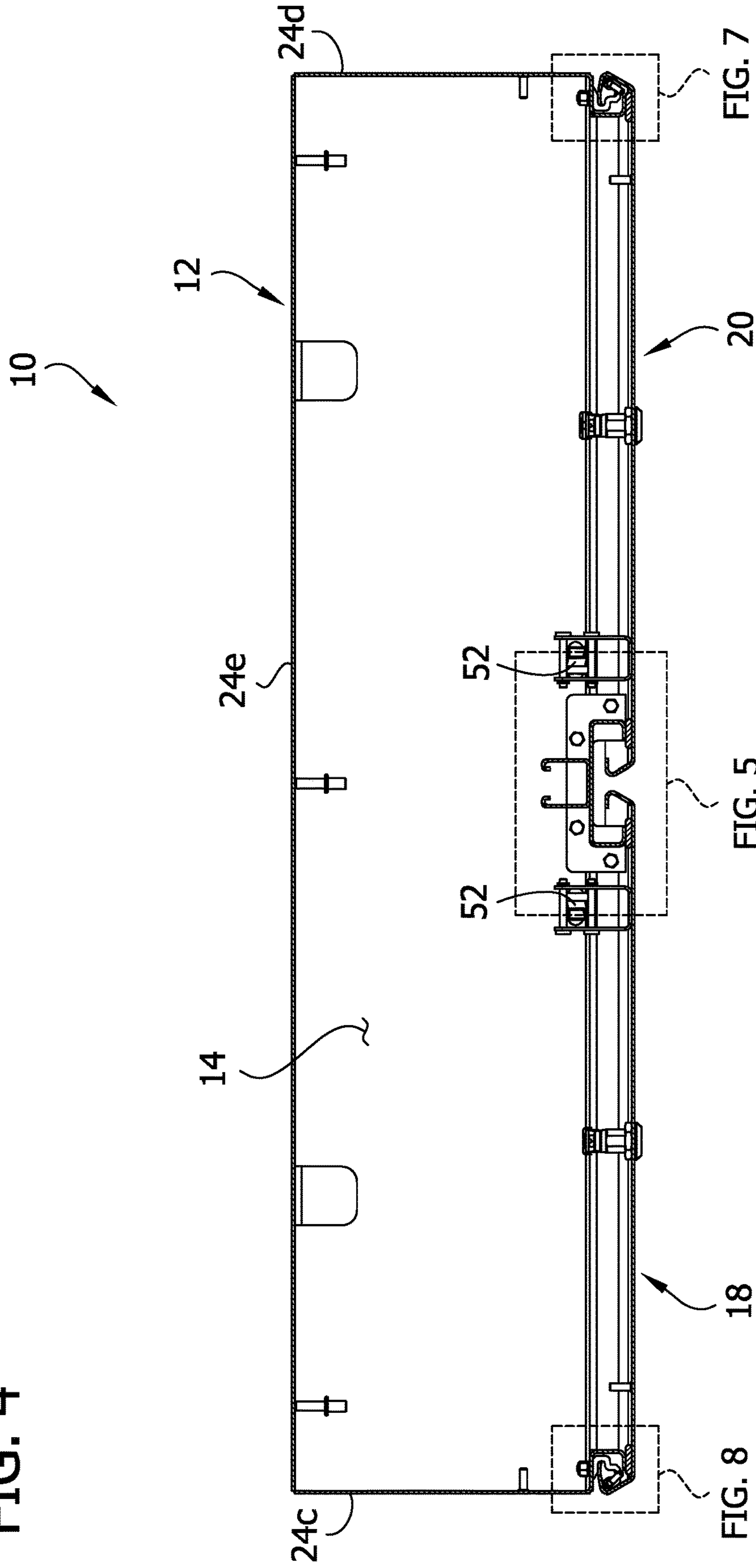


FIG. 8

FIG. 5

FIG. 7



FIG. 5B

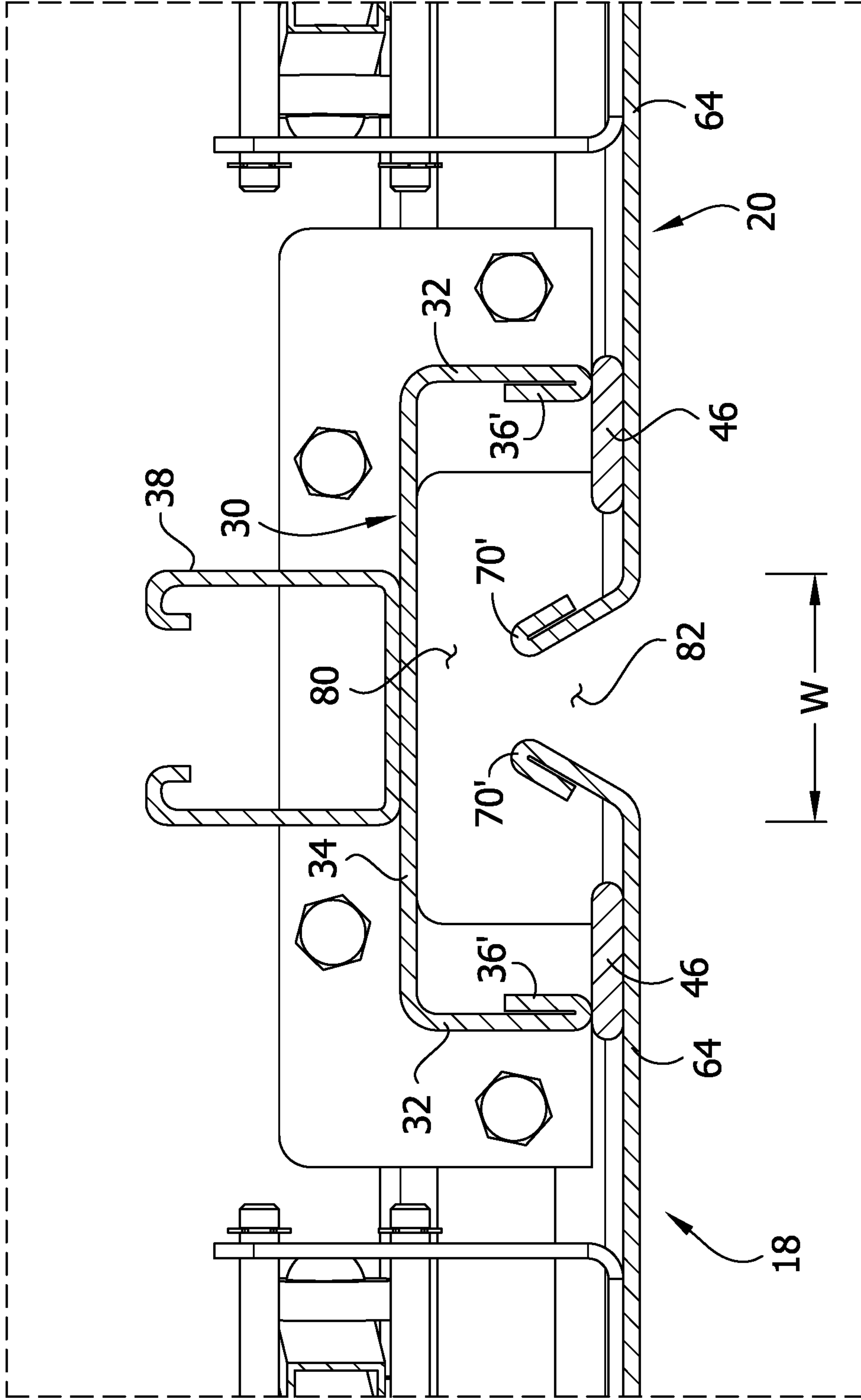




FIG. 5C

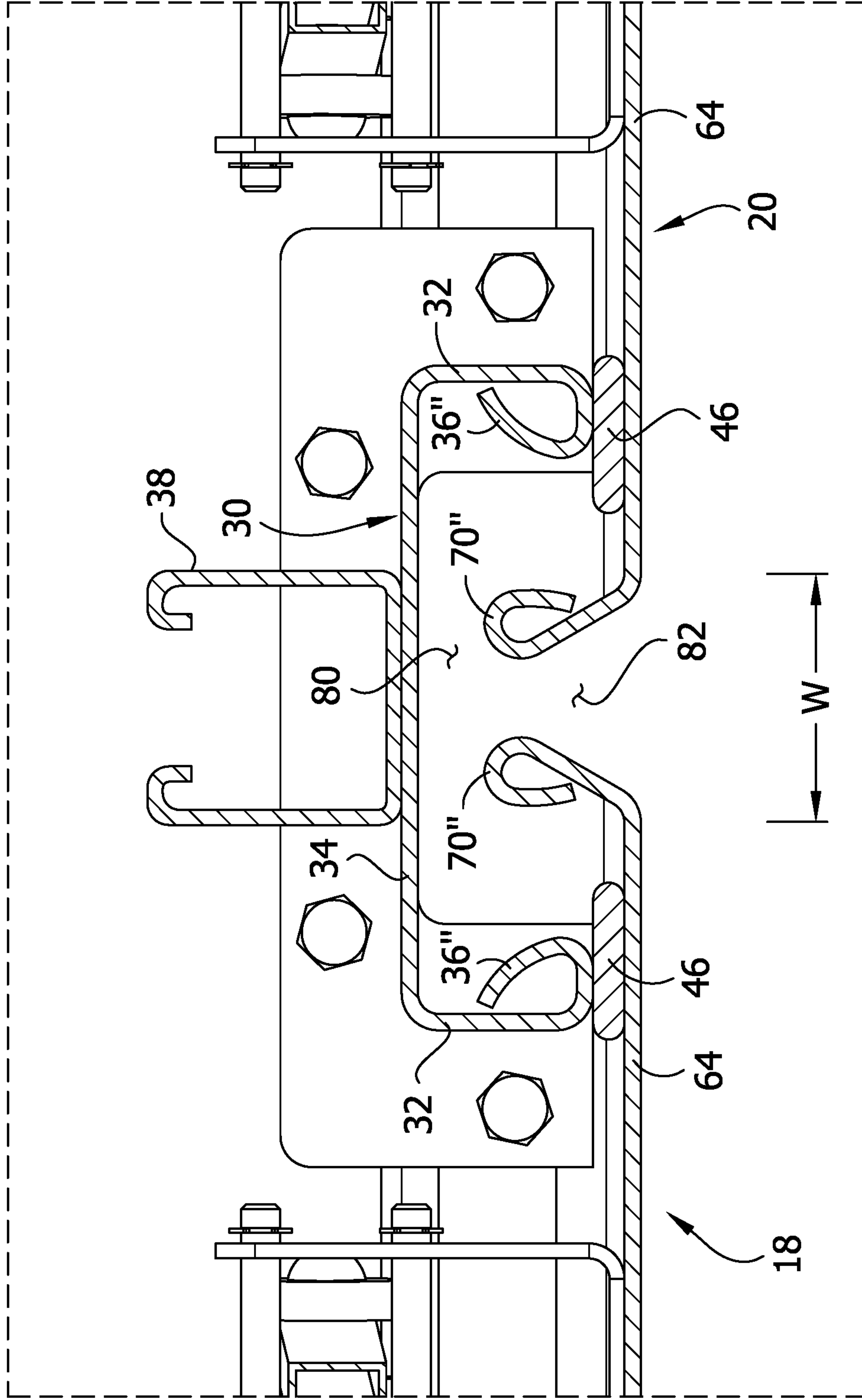


FIG. 6

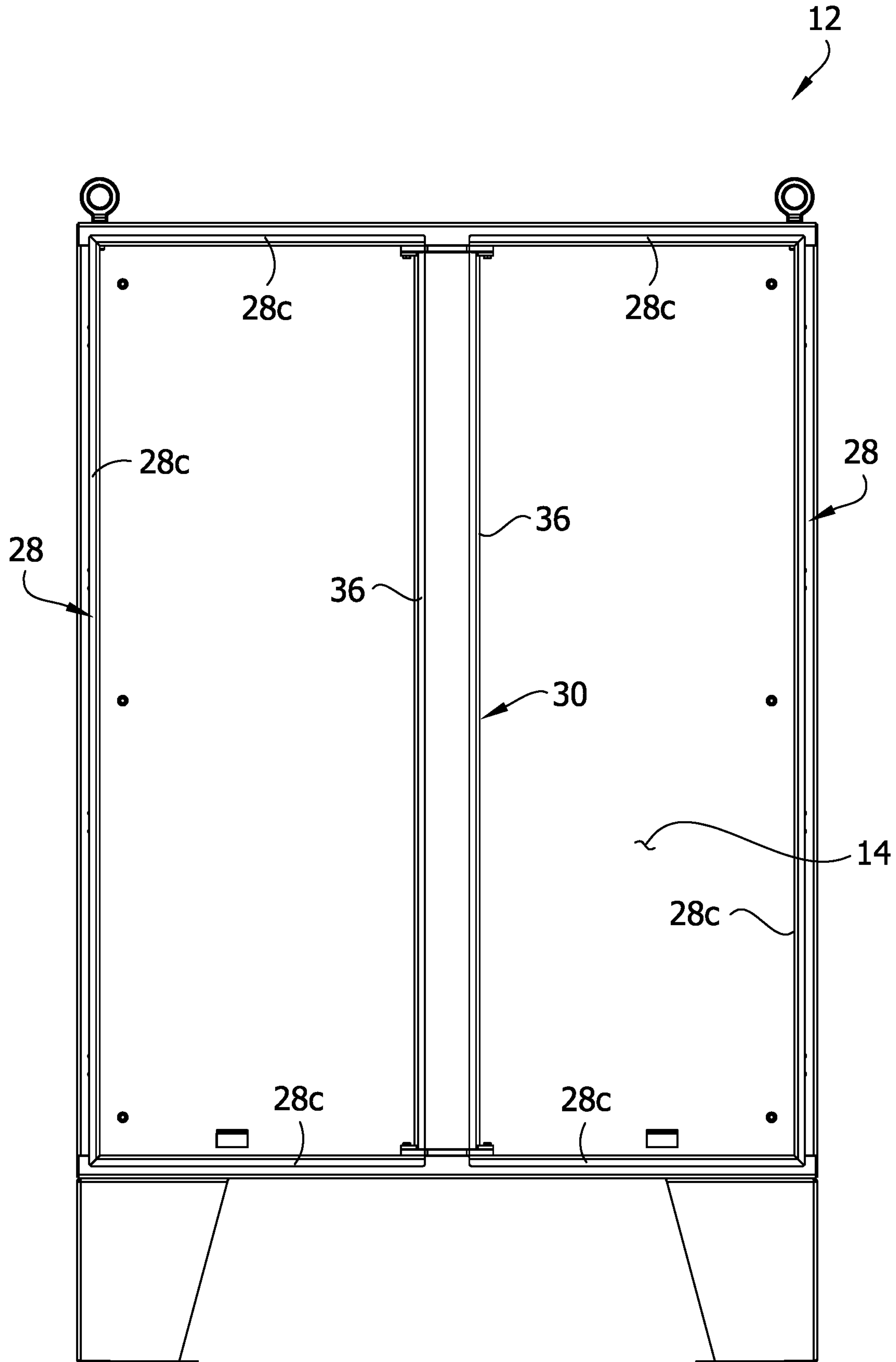


FIG. 7

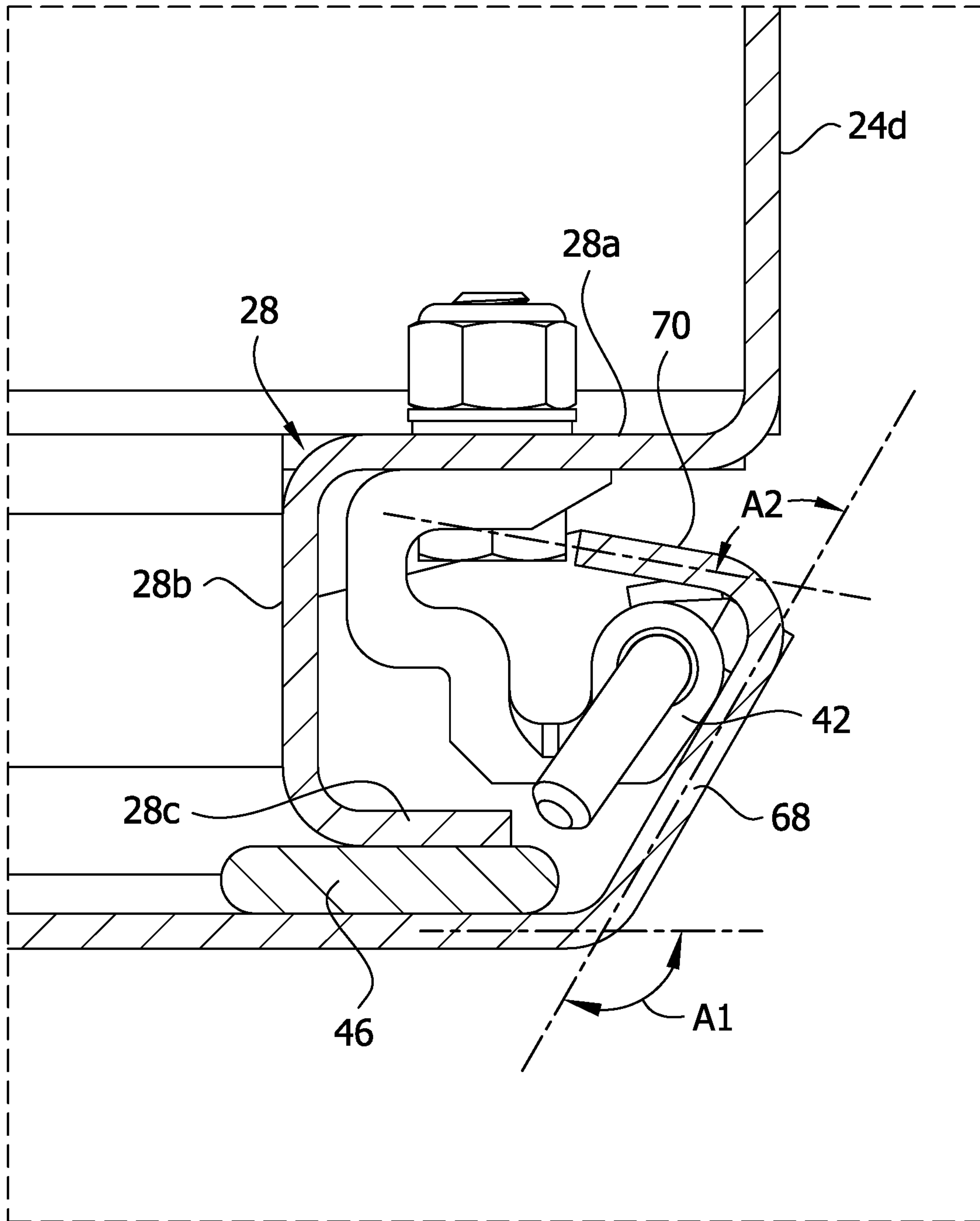


FIG. 8

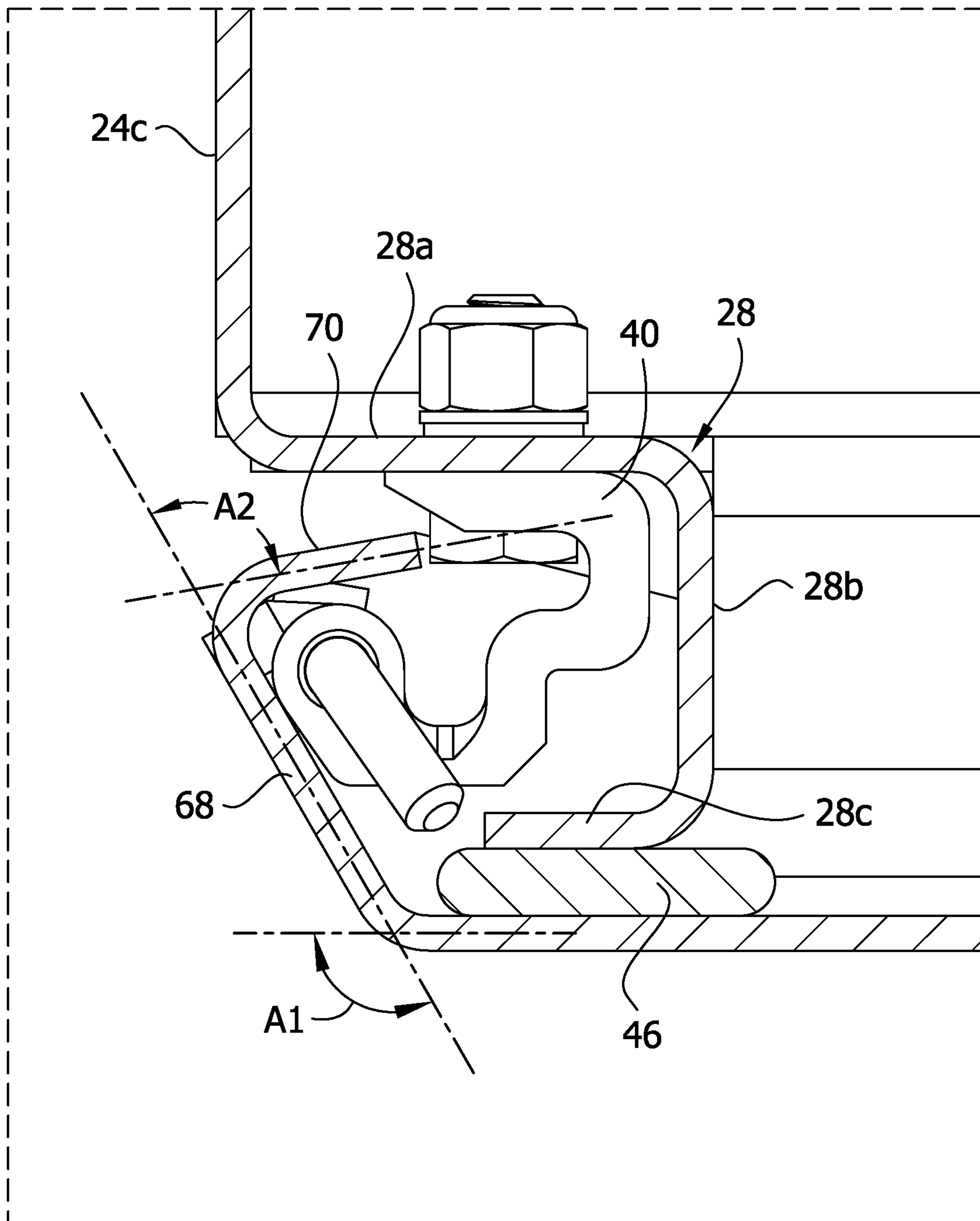






FIG. 10

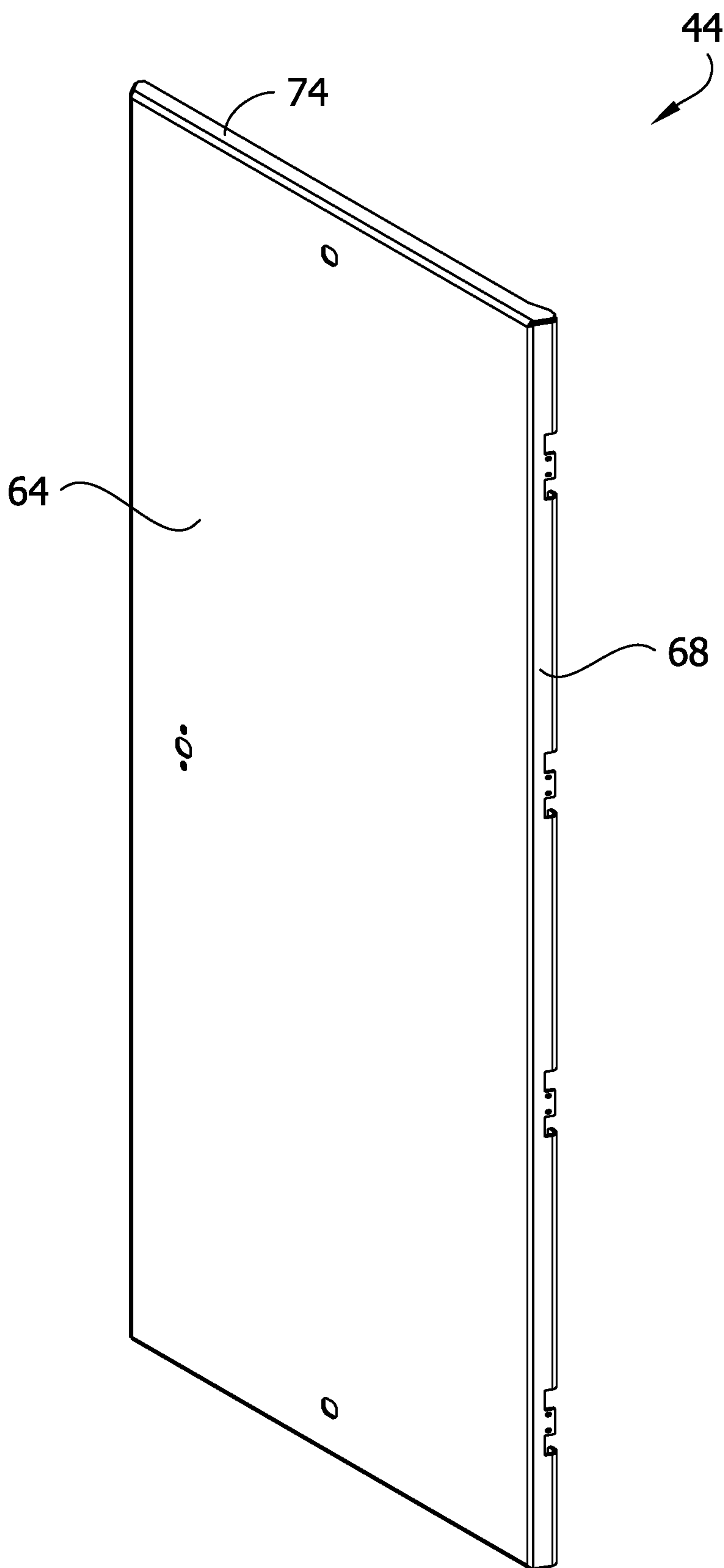


FIG. 11

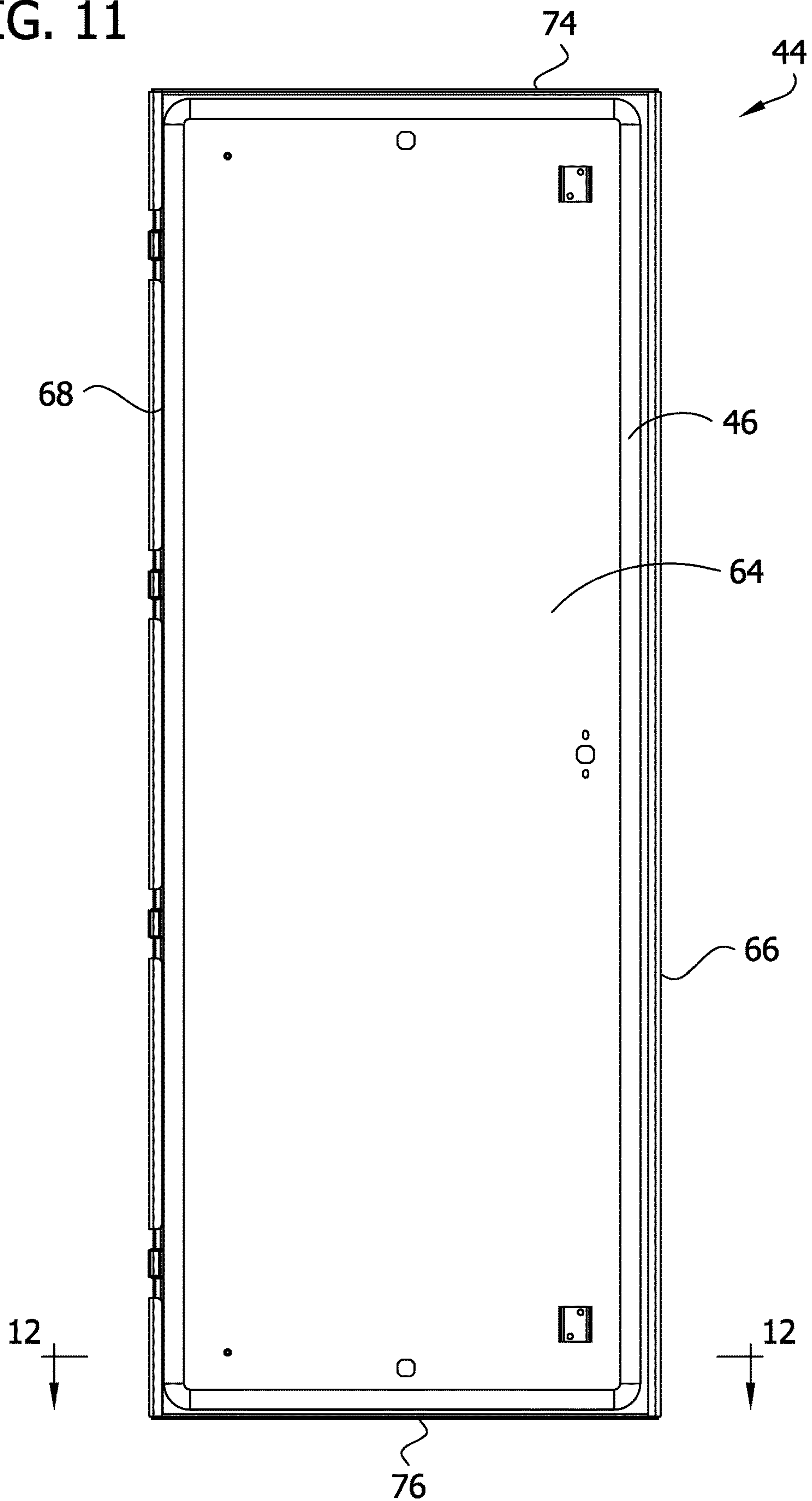


FIG. 12

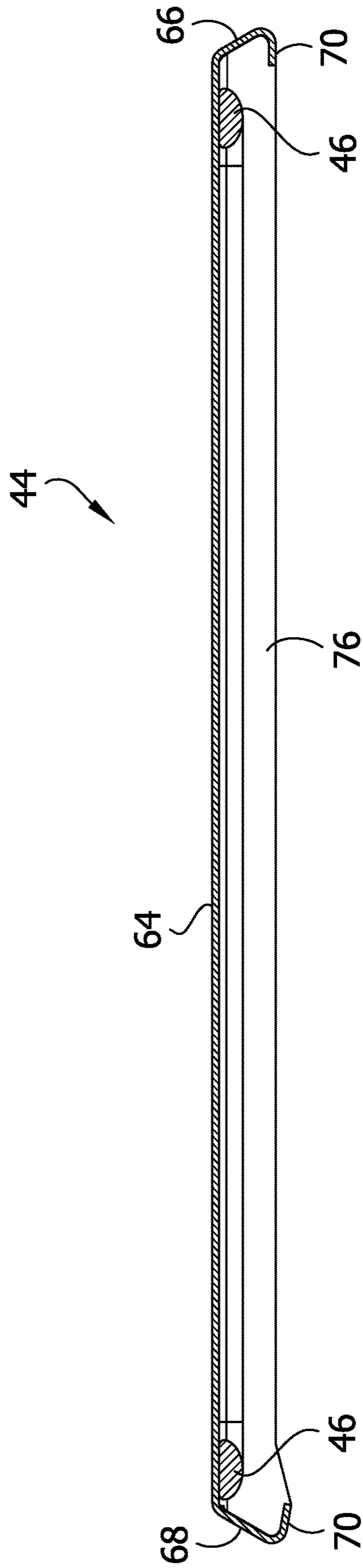


FIG. 13

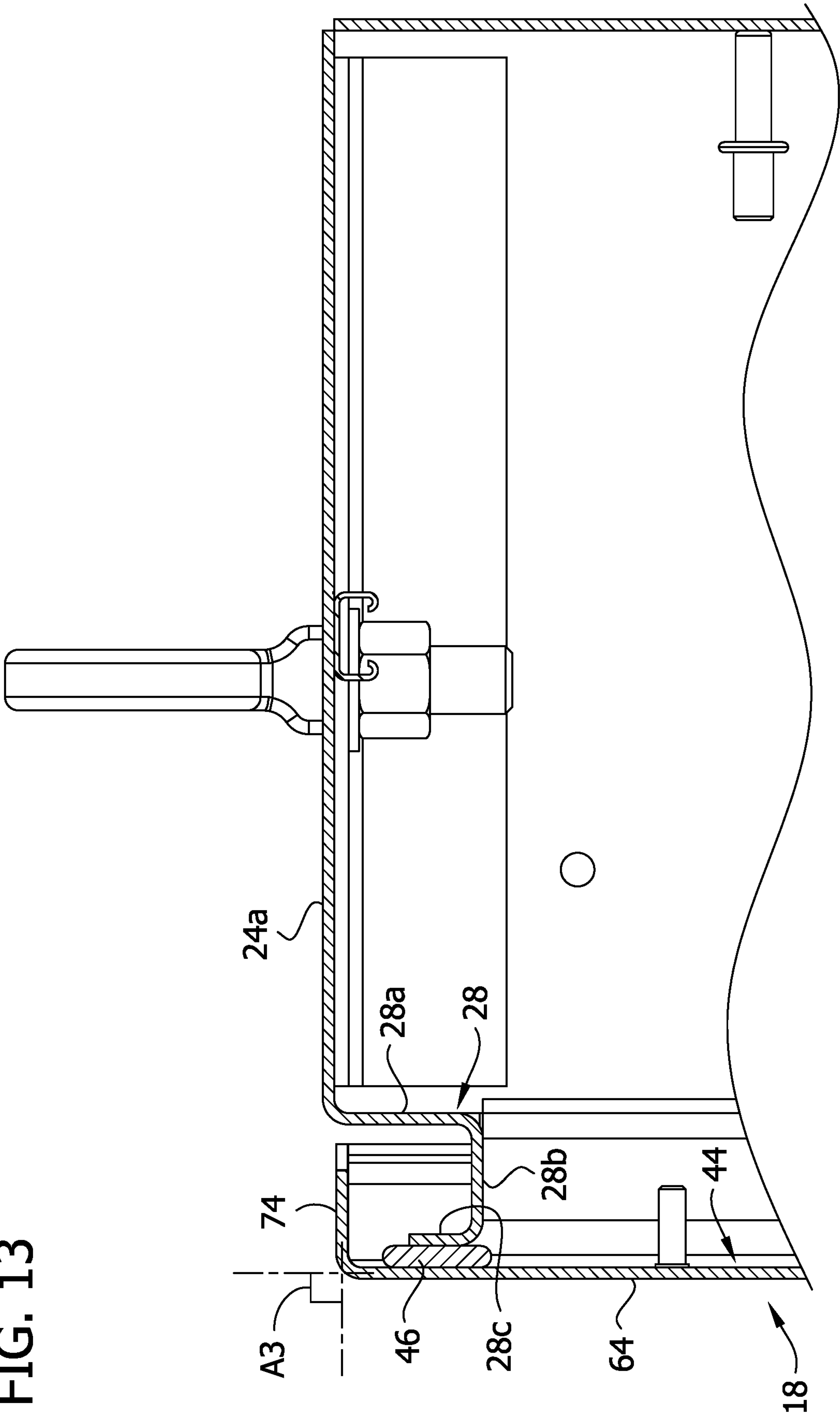
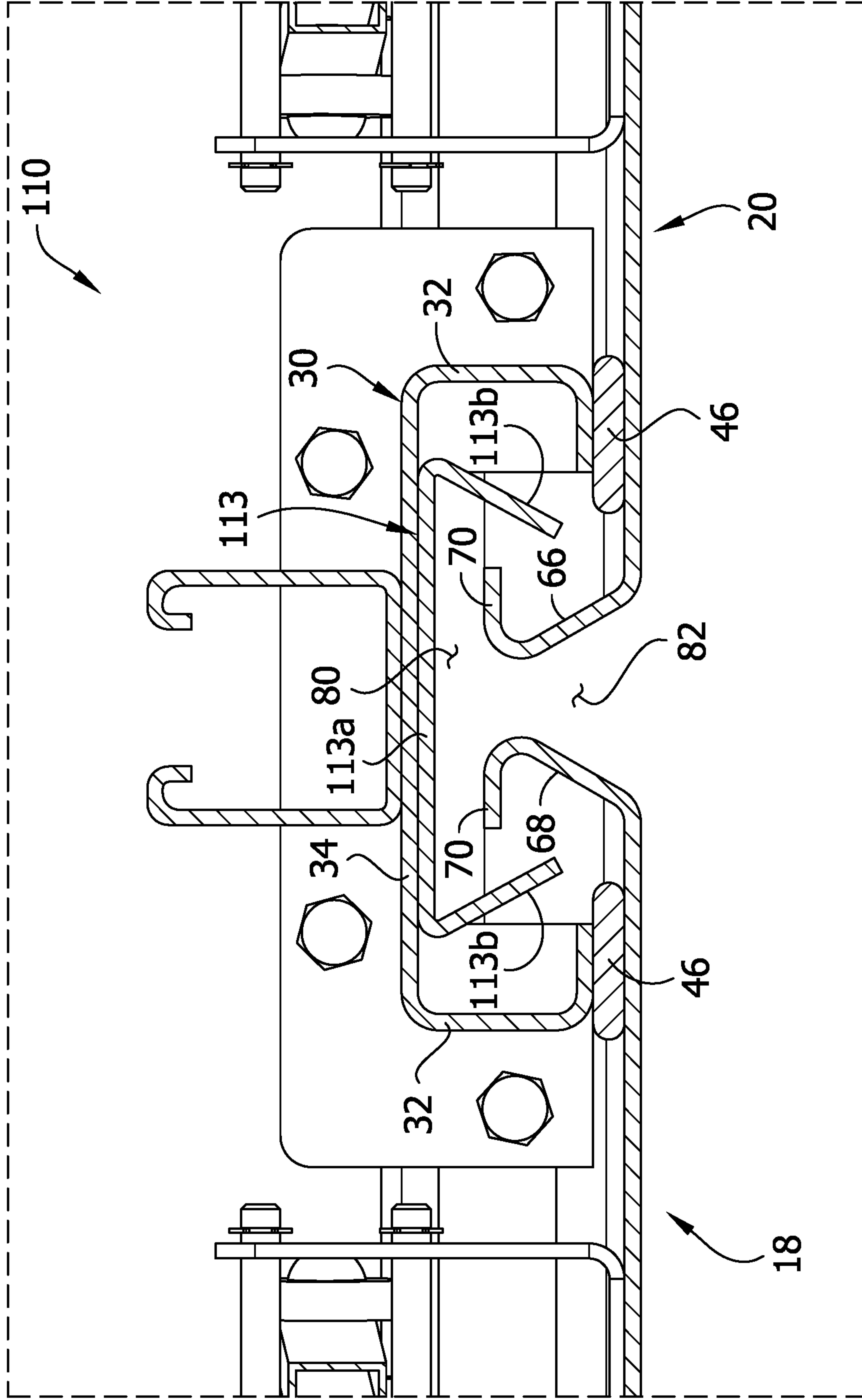


FIG. 14A





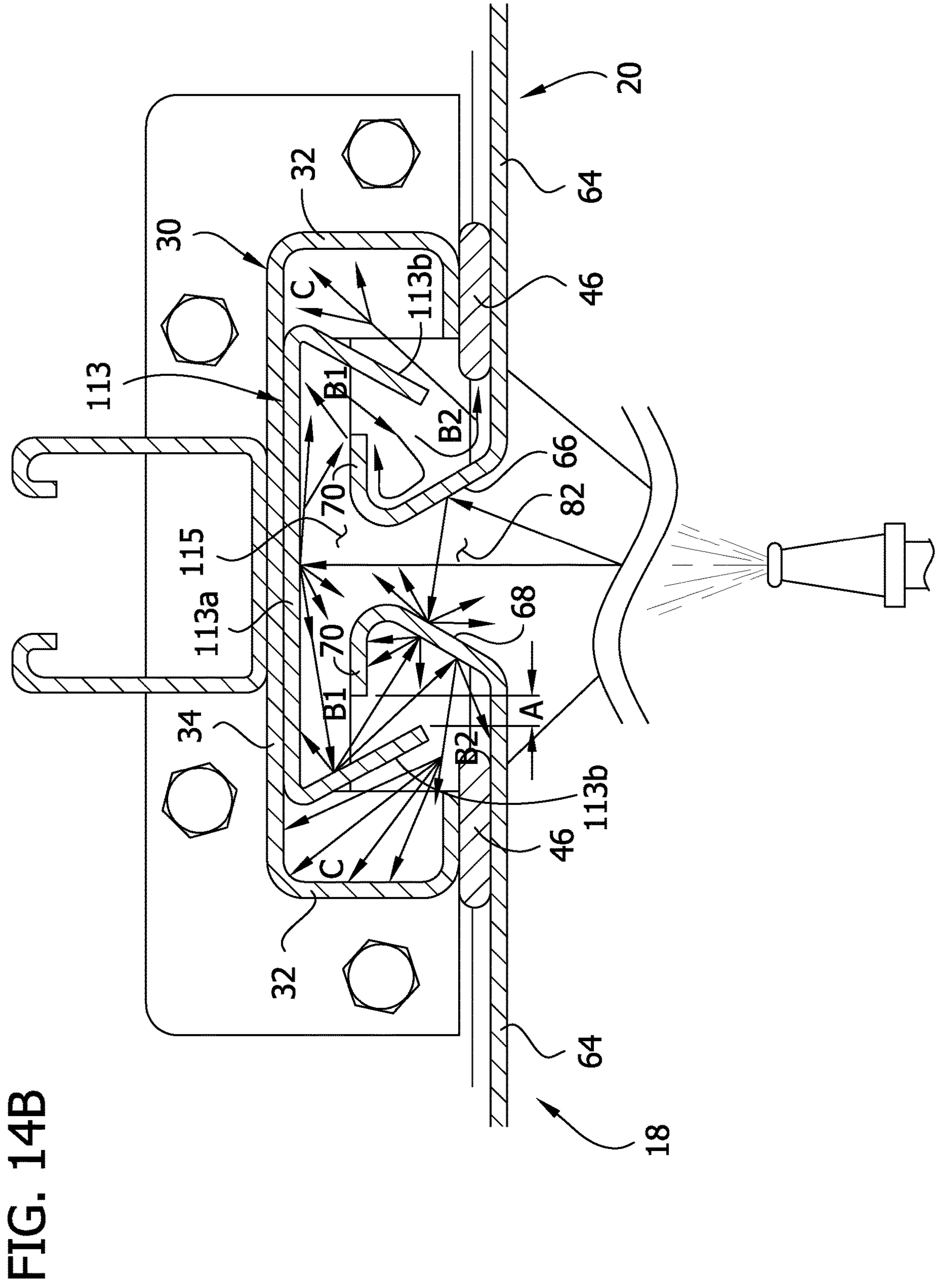


FIG. 15

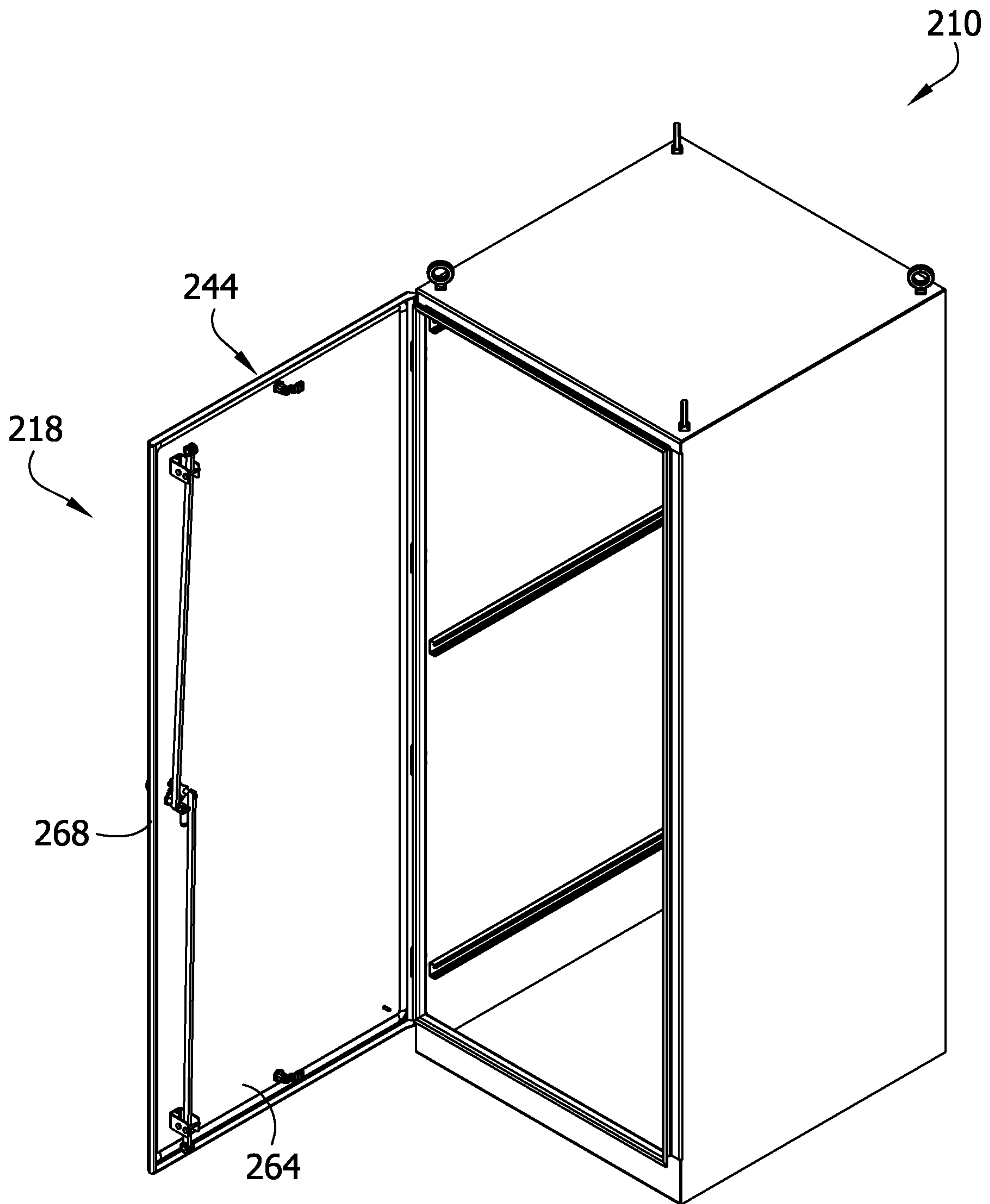


FIG. 16

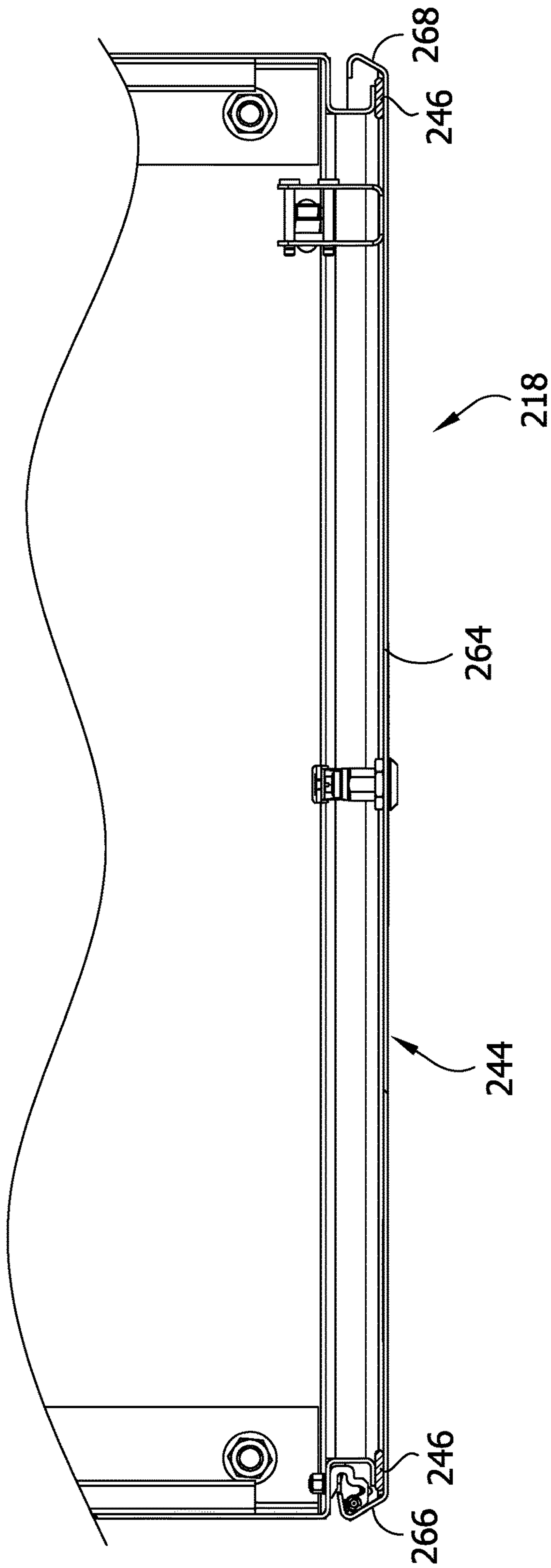


FIG. 17

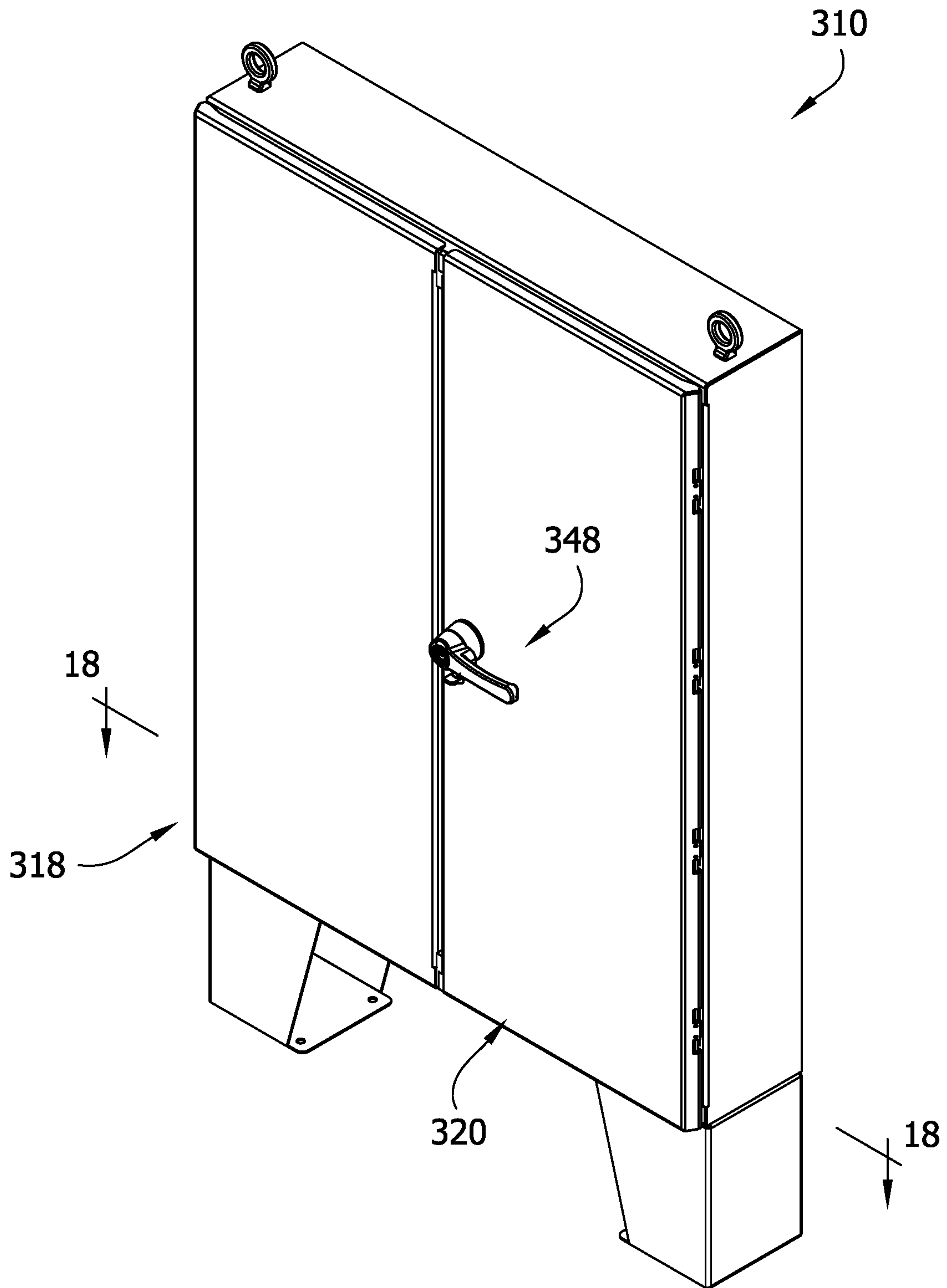
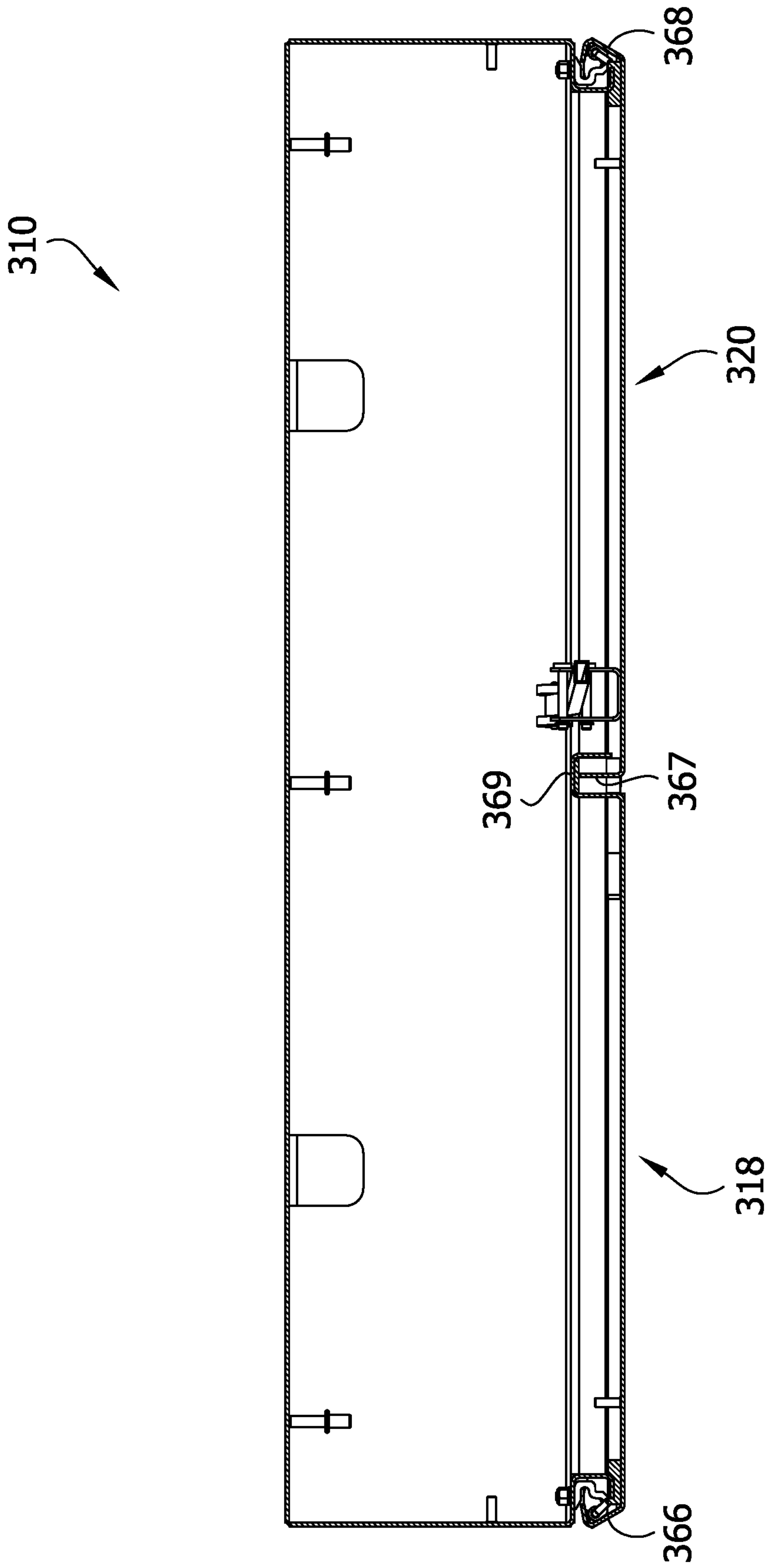


FIG. 18





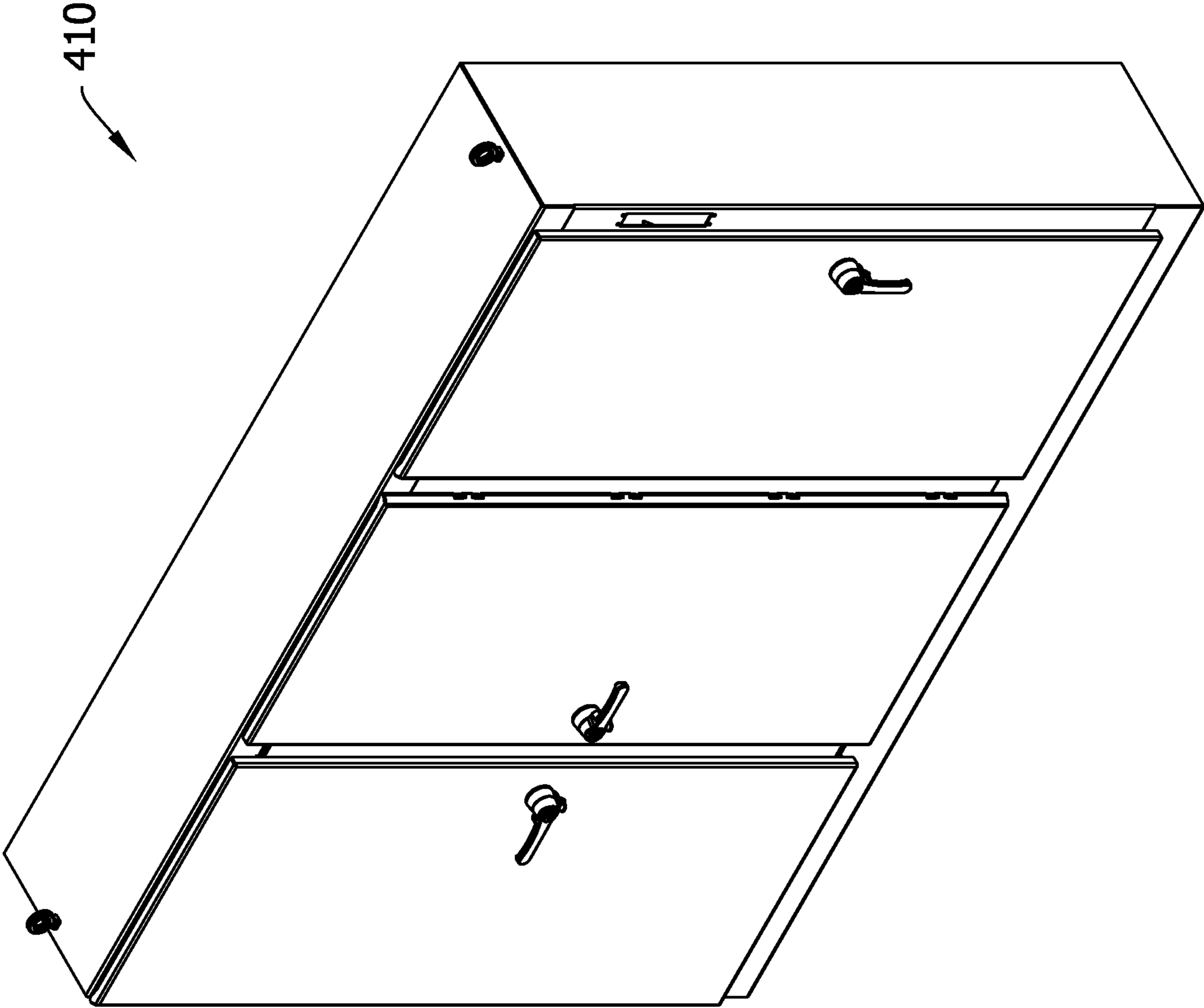


FIG. 19

**1****ONE OR MORE DOORS WITH ONE OR MORE ANGLED SIDE FLANGES FOR ELECTRICAL PANEL ENCLOSURE**

## FIELD OF THE DISCLOSURE

The present disclosure generally relates to one or more doors with one or more angled side flanges for an electrical panel enclosure.

## BACKGROUND OF THE DISCLOSURE

Electrical control panels are collections of electrical power and control components and operator devices housed within an electrical panel enclosure designed to serve a specified purpose. Certain electrical panel enclosure should meet certain safety standards, in particular, safety standards pertaining to the ingress of water or other liquid into the enclosure. An example of such a safety standard is UL 508A, "Industrial Control Panels."

## SUMMARY OF THE DISCLOSURE

In one aspect, a door hingedly secured to an enclosure body at a front side of the enclosure body includes a door panel having a planar door panel body with opposite first and second side edge margins, and a first side door flange extending rearwardly from the first side edge margin of the door panel body. The first side door flange extends at an angle greater than 90 degrees relative to the planar door panel body.

Other features will be in part apparent and in part pointed out hereinafter.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective of an electrical panel enclosure configured to house electrical components, such as electrical power and control components, doors of the enclosure being in closed positions;

FIG. 2 is similar to FIG. 1 with the doors being in open positions;

FIG. 3 is a top plan view of FIG. 2;

FIG. 4 is a cross section of the enclosure taken in the plane defined by the line 4-4 in FIG. 1;

FIG. 5A is an enlarged, partial view of the cross section of the enclosure as indicated in FIG. 4;

FIG. 5B is similar to FIG. 5A, except return lips and return flanges are shown as being flattened hems;

FIG. 5C is similar to FIG. 5A, except return lips and return flanges are shown as being teardrop hems;

FIG. 6 is a front elevation of the enclosure, with the doors removed therefrom;

FIG. 7 is an enlarged, partial view of the cross section of the enclosure as indicated in FIG. 4;

FIG. 8 is an enlarged, partial view of the cross section of the enclosure as indicated in FIG. 4;

FIG. 9 is a rear elevation of the enclosure with a rear wall of the enclosure removed;

FIG. 10 is a perspective of a door panel of one of the doors of the enclosure;

FIG. 11 is a rear elevation of the door panel of FIG. 10, including a door gasket secured to an interior of the door panel;

FIG. 12 is a cross section of FIG. 11 taken in the plane defined by the line 11-11;

**2**

FIG. 13 is a partial cross section of the enclosure taken in the plane defined by the line 13-13 in FIG. 1;

FIG. 14A is cross section of second embodiment of an electrical panel enclosure similar to the first embodiment but including a baffle;

FIG. 14B is similar to FIG. 14A, but showing flow of liquid;

FIG. 15 is a perspective of a third embodiment of an electrical panel enclosure, a door of the enclosure being in an open position;

FIG. 16 is a cross section of the third embodiment of the electrical panel enclosure, the door of the enclosure being in a closed position;

FIG. 17 is a perspective of a fourth embodiment of an electrical panel enclosure;

FIG. 18 is a cross section of the fourth embodiment of the electrical panel enclosure taken in the plane defined by the line 18-18 in FIG. 17; and

FIG. 19 is a perspective of a fifth embodiment of an electrical panel enclosure.

Corresponding reference characters indicate corresponding parts throughout the drawings.

## DETAILED DESCRIPTION OF THE DISCLOSURE

Referring to FIG. 1 of the drawings, one embodiment of an electrical panel enclosure configured to house electrical components, such as electrical power and control components, is generally indicated at reference numeral 10. The electrical panel enclosure 10 comprises an enclosure body, generally indicated at 12, defining an interior space 14 in which the electrical components are housed, and left and right (broadly, first and second) doors, generally indicated at 18, 20, respectively, secured to the enclosure body. The enclosure body 12 includes opposite upper and lower walls, 24a, 24b, respectively; opposite left and right side walls, 24c, 24d, respectively; and a rear wall 24e secured to one another, such as by welding. As used herein, terms denoting relative locations of structures and components, including but not limited to "upper," "lower," "left," "right," "rear," "front," and like terms, are used to describe relative locations as shown in the drawings, and are not meant in a limiting sense.

In general, the enclosure body 12 has a box shape, although it may be of other shapes without departing from the scope of the present disclosure. A front side of the enclosure 10 is open to the interior space 14 of the enclosure body 12. In one example, the upper, lower, left, and right walls 24a, 24b, 24c, 24d, respectively, may be formed from sheet metal, such as steel. The enclosure body 12 may be of other configurations and formed in other ways. The upper, lower, left, and right walls 24a, 24b, 24c, 24d, respectively, have front margins defining channel frame members, generally indicated at 28, extending around a perimeter of the open front side of the enclosure body 12. As can be seen in FIGS. 7, 8, and 13, for example, the channel frame members 28 are generally J-shaped in cross section. The channel frame members 28 have an inwardly extending first wall 28a, a second wall 28b extending forward from the first wall, and a front wall (or lip) 28c extending outwardly from the second wall and generally parallel to the first wall. In other examples, the channel frame members may be formed from metal bar stock or other material and secured to the upper, lower, left, and right walls, 24a, 24b, 24c, 24d, respectively, for example.



A center frame post, generally indicated at **30**, extends heightwise between and interconnects upper and lower portions (e.g., the raised front edge margins **28** of the upper and lower walls **24a**, **24b**, respectively) of the front perimeter frame member. As shown in FIG. **5**, the illustrated center frame post **30** is generally channel-shaped having opposite side walls **32** extending forward from a rear wall **34** of the center post, and return flanges **36** extending toward one another from the front ends of the respective side walls. The return flanges **36** may be coplanar with the front third wall **28c** or extend at other angles. In other embodiments, the return flanges **36** may be hemmed. For example, the return flanges may be formed as flattened hems **36'**, as shown in FIG. **5B**, or tear drop hems **36''**, as shown in FIG. **5C**, or other types of hems, including but not limited to open hems, and rope hems. The center frame post **30** and the front channel members **28** define left and right door frames (broadly, first and second doors) for the respective left and right doors **18**, **20**, respectively. The center frame post **30** may be formed from metal, such as steel. The center frame post **30** may be welded and/or bolted, or otherwise fastened or attached to the front peripheral frame. In the illustrated embodiment, a strut **38** is secured (e.g., welded) to a rear side of the rear wall **34** of the center frame post **30** to provide structural support to the center frame post.

As shown in FIG. **8**, the left door **18** is hingedly coupled to the left side wall **24c** at the front side of the enclosure **10** via one or more first hinges **40**, for example. The left door **18** is selectively pivotable away from and toward the front side of the enclosure **10** to open and close a left side portion of the front side of the enclosure defined by a left portion of the channel member **28** and the center frame post **30**. As shown in FIG. **7**, the right door **20** is hingedly coupled to the right side wall **24d** at the front side of the enclosure **10** via one or more second hinges **42**, for example. The right door **20** is selectively pivotable away from and toward the front side of the enclosure **10** to open and close a right side portion of the front side of the enclosure defined by a right portion of the front perimeter frame member and the center frame post **30**. In the illustrated embodiment, the left and right hinges **40**, **42** are hidden by the respective left and right doors **18**, **20**. In particular, the hinges **40**, **42** are received in channels defined by the channel frame members **28** at the left and right sides of the enclosure **10**. Each door **18**, **20** includes a door panel (e.g., sheet metal panel), generally indicated at **44**; a door gasket **46** secured to an interior side of the door panel; and a door handle assembly, generally indicated at **48**, secured to the door panel.

Each illustrated door handle assembly **48** is a conventional door handle assembly for electrical panel enclosures. Briefly, each door handle assembly **48** includes a bar assembly **52** (FIG. **9**) having a length extending heightwise of the corresponding door, and a handle **54** operatively connected to the bar assembly. The length of the bar assembly **52** is selectively adjustable by turning the associated handle **54**. When the door **18**, **20** is closed and the bar assembly **52** is in its lengthened configuration, longitudinal ends of the bar assembly (e.g., upper and lower rollers **58**) may engage upper and lower portions of the door frame to inhibit opening of the door. To open the door **18**, **20**, the handle **54** is rotated, whereby the bar assembly **52** is shortened and the longitudinal ends of the bar assembly clear the upper and lower portions of the door frame and the door can be pivoted to its open position. As is also generally known, the door handle assembly **48** may also have a lock assembly for restricting access to the interior of the enclosure **10**. In addition or alternatively, separate lock assemblies may be

associated with the doors **18**, **20**. It is understood that the doors **18**, **20** may include other types of door handle assemblies without departing from the scope of the present invention.

As can be seen in FIG. **11**, each door gasket **46** extends around the interior side of the corresponding door **18**, **20** adjacent the periphery thereof. For example, the door gaskets **46** may be secured to the respective doors **18**, **20** by adhesive or in other ways. When the left door **18** is closed, the gasket **46** on the left door seats on the left door frame (e.g., the lips **36** and the front flanges **28c**) to form a liquid-tight seal therebetween, which extending around an entire perimeter of the left door frame. When the right door **20** is closed, the gasket **46** on the right door seats on the right door frame to form a liquid-tight seal therebetween, which extends around an entire perimeter of the right door frame. In one example, each gasket **46** may comprise one or more compressible strips of material, which may be formed from rubber or other resiliently compressible material. The illustrated door gaskets **46** have a D-shaped cross section, although the gaskets may have other cross-sectional shapes, including but not limited to rectangular, square, oval, circular, ribbed, among others.

Referring to FIGS. **7**, **8** and **10-12**, each door panel **44** includes a generally planar door panel body **64** having upper, lower, left side and right side edge margins. A left door side flange **66** extends along the left edge margin of the door panel body **64** and projects rearwardly therefrom. A right door side flange **68** extends along the right edge margin of the door panel body **64** and projects rearwardly therefrom. Each of the side door flanges **66**, **68**, respectively, is angled laterally outward from the associated edge margin, whereby, as shown in FIGS. **7** and **8** for example, each door side flange extends at an angle **A1** less than 90 degrees relative to the associated door panel body **64**. In one example, the angle **A1** may measure from about 100 degrees to about 160 degrees, or from about 110 to about 140 degrees, and in one particularly embodiment, about 120 degrees. In this way, the left and right side door flanges **66**, **68** define or form respective beveled left and right sides of the door panel **44**. In the illustrated embodiment, a return lip **70** extends from a rear end of each door side flange **66**, **68** in a direction generally toward the other return lip. The bend at the return lip **70** provides a smooth edge to inhibit injury that may be caused from a sharper edge. Each return lip **70** may extend at an angle **A2** relative to the associated door side flange **66**, **68**. The angle **A2** may measure from about 120 degrees to about 75 degrees, or from about 110 to about 90 degrees, and in one particularly embodiment, about 100 degrees. In one example, each return lip **70** may extend generally parallel to the generally planar door panel body **64**. In other embodiments, the return lips **70** may be hemmed. For example, the return lips may be formed as flattened hems **70'**, as shown in FIG. **5B**, or tear drop hems **70''**, as shown in FIG. **5C**, or other types of hems, including but not limited to open hems, and rope hems. In the illustrated embodiment, upper and lower door flanges **74**, **76** extend along the respective upper and lower edge margins of each door panel body **64** and project rearwardly therefrom. Each of the upper and lower door flanges **74**, **76** may project at an angle **A3** relative to the associated door panel body measuring about 90 degrees or other angles. In the illustrated embodiment, the door gasket **46** is disposed inward of and adjacent to each of the door flanges **66**, **68**, **74**, **76**.

In the illustrated embodiment, the hinge-side door flanges (e.g., the left door side flange **66** of the left door **18** and the right door side flange **68** of the right door **20**) increase the



maximum open angle MA to which the respective doors can be opened relative to the front side of the enclosure 10. This increased maximum open angle MA is due to the angled door side flanges 66, 68 defining beveled sides that provide clearance relative to the left and right side walls 24c, 24d as the respective left and/or right doors 18, 20 are open to an angle generally greater than about 135 degrees relative to a front plane defined by the front side of the enclosure 10. In one example, the left and right doors 18, 20 may be openable to a maximum open angle of about 165 degrees. In addition, the angled door side flanges 66, 68 defining the beveled left and right side walls of the doors 18, 20 direct water, such as rain or water from a fire hose, laterally outward away from the seal interface of the left gasket portion and the left portion of the door frame, and laterally outward away from the seal interface the seal interface of the right gasket portion and the right portion of the door frame. Each angled door side flange 66, 68 adjacent the handles (e.g., inner door side flanges) also deflect water away from the seal interfaces, as shown in FIG. 14B, for example.

In the illustrated embodiment, the handle-side door flanges (e.g., the right door side flange 68 of the left door 18 and the left door side flange 66 of the right door 20) generally come together (i.e., are disposed adjacent one another) at the center frame post 30 when the doors are closed. As shown in FIG. 5, when the doors 18, 20 are closed, the handle-side door flanges 66, 68 are received in the channel 80 of the center frame post 30 and generally oppose one another along the height of the enclosure 10. In the illustrated embodiment, the return lips 70 of the handle-side door flanges may be generally parallel to the rear wall 34 of the center frame post 30. As can be seen, the two handle-side flanges 66, 68 define a flange channel 82 extending along the height of the enclosure 10 and having a generally V-shaped cross section with a width W that tapers into the channel 80 of the center frame post 82. Moreover, the angled side door flanges 66, 68 deflects water entering the center frame post 30, thereby reducing the velocity and energy of the water before the water makes contact with the liquid-tight seals. It is believed that the shape of this flange channel 82, as defined by the angled side door flanges, 66, 68, creates a turbulent flow of water when water is directed at the doors 18, 20 in a direction generally perpendicular to the doors. It is further believed that, as compared to laminar flow of water, the turbulent flow of water reduces forces (e.g., liquid pressures) exerted on seal interfaces at the door gasket 46 and the center frame post 30 to inhibit the ingress of water between the seal interfaces and into the interior 14 space of the enclosure 10.

Referring to FIG. 14, another embodiment of an electrical panel enclosure similar to the first electrical panel enclosure 10 is generally indicated at reference numeral 110. Since this enclosure 110 is similar to the first enclosure 10, similar components are indicated by the same reference numerals. Unless otherwise described below herein, the teachings set forth above with respect to the enclosure 10 apply to the present enclosure 110.

Unlike the first enclosure 10, the present enclosure 110 includes a baffle, generally indicated at 113, secured inside the center frame post 30, and in particular, to the front side of the rear wall 34 of the center frame post. The illustrated baffle 113 comprises a channel-shape member (e.g., a strut) extending lengthwise along the center frame post. A rear wall 113a of the baffle 113 is secured (e.g., welded) to the rear wall 34 of the center frame post 30, and opposing side walls 113b extend forward from the rear wall of the baffle. The illustrated side walls 113b extend at acute angles

relative to the rear wall 113a, although in other embodiments, the side walls may extend perpendicular to or at obtuse angles with respect to the rear wall 113a. When the left and right doors 18, 20 are closed, the hinge-side flanges 66, 68 extend into the baffle (e.g., the channel 115 defined by the baffle), and the return lips 70 are received in the channel. Thus, the side walls 113b are disposed between (in a liquid flow direction) between the door gaskets 46 and the hinge-side flanges 66, 68. The V-shaped channel 82 is in communication with and leads into the channel 115 of the baffle 113. A clearance gap A (FIG. 14) allows the return lips 70 to move past the side walls 113a, 113b of the baffle 113 to allow opening and closing of the doors 18, 20.

FIG. 14B is a schematic depicting the flow of water from a hose H between the two inner or handle-side side door flanges 66, 68. As can be seen from FIG. 14, the baffle 113 creates a tortuous path for the water as the water flows between the side door flanges 66, 68 and into the channel of the center frame post 30. In effect, the water changes directions as it makes contact with the numerous surfaces of the flanges 66, 68, the return lips 70, the baffle 113, and the center frame post 30. At each instance where the water changes directions, energy and velocity of the water is lost, thereby reducing the energy (e.g., velocity) of the water that contacts the seal interfaces at the gasket 46 and the center frame post 30. In addition, constricted liquid flow paths or channels B1, B2 are defined between the flanges 66, 68 (including the return lips 70) and the baffle 113, and between the door panel bodies 64 and the baffles, respectively. The water then enters an expansion chamber C, which surrounds and is downstream of the seal interface to allow water to flow past the seal interface to an area of less resistance. This further relieves pressure on the seal interface. The baffle 113 may also create and/or further facilitate a turbulent flow of water and/or inhibits water flow toward the door gaskets 46 when water is directed at the doors 18, 20 in a direction generally perpendicular to the doors. It is further believed that, as compared to laminar flow of water, the turbulent flow of water reduces forces (e.g., liquid pressures) exerted on seal interfaces at the door gasket 46 and the center frame post 30 to inhibit the ingress of water between the seal interfaces and into the interior 14 space of the enclosure 10. It is understood that in other embodiments the doors 18, 20 may have conventional side flanges. That is the side flanges may not define the beveled side walls 66, 68, as described herein. For example, the side flanges may extend generally perpendicular to the respective door panel bodies.

Referring to FIGS. 15 and 16, another embodiment of an electrical panel enclosure similar to the first electrical panel enclosure 10 is generally indicated at reference numeral 210. Since this enclosure 210 is similar to the first enclosure 10, similar components are indicated by like reference numerals plus 200. Unless otherwise described below herein, the teachings set forth above with respect to the enclosure 10 apply to the present enclosure 210.

Unlike the first enclosure 10, the third enclosure 210 includes a single door 218 hingedly secured to the enclosure body 212 via one or more hinges 240. The teachings set forth above with respect to the door 18 apply equally to the present door 118. That is, the present door 218 includes a door panel (e.g., sheet metal panel), generally indicated at 244; a door gasket 246 secured to an interior side of the door panel; and a door handle assembly, generally indicated at 248, secured to the door panel. Moreover, a left door side flange 266 extends along the left edge margin of the door panel body 264 and projects rearwardly therefrom, and a right door side flange 268 extends along the right edge



margin of the door panel body 264 and projects rearwardly therefrom. Each of the side door flanges 266, 268, respectively, is angled laterally outward from the associated edge margin, as taught above with respect to the door 18. Because the second enclosure 210 includes only the single door 218, 5 the enclosure does not include the center post frame of the first enclosure 10. Instead, the handle-side door flange (e.g., the right side door flange 268) directs direct water, such as rain or water from a fire hose, laterally outward away from the seal interface the seal interface of the right gasket portion 10 and the right portion of the door frame, rather than into a channel of a center frame post. The hinge-side door flange (e.g., the left side door flange 266) performs the same function.

Referring to FIGS. 17 and 18, another embodiment of an electrical panel enclosure similar to the first electrical panel enclosure 10 is generally indicated at reference numeral 310. Since this enclosure 310 is similar to the first enclosure 10, similar components are indicated by like reference numerals plus 200. Unless otherwise described below herein, the 20 teachings set forth above with respect to the enclosure 10 apply to the present enclosure 310.

The present enclosure 310 includes two doors 218, 220, but unlike the first embodiment 10, the present enclosure 310 does not include a center frame post and only the right 25 door includes a door handle assembly 348. Instead, the right door 320 includes an inner or door-handle side flange 367 that nests within a channel defined by an inner or door-handle side flange 369 of the left door 318. Accordingly, the inner or door-handle side flanges 367, 369 are not of the 30 same type as the corresponding flanges of the first embodiment. However, the hinge-side door flanges (e.g., the left-side door flange 366 of the left door 318 and the right-side door flange 368 of the right door) are the same as the first embodiment 10. Therefore, the two doors 318, 320 have 35 increased maximum open angles, as described above.

Referring to FIG. 19, another embodiment of an electrical panel enclosure is generally indicated at reference numeral 410. This enclosure 410 is essentially a combination of enclosures 10 and 210 into a single enclosure. That is this enclosure includes the doors 18, 20, 210 of the enclosures 10 and 210 to form a large enclosure with three different 40 accesses to the interior of the enclosure. The teachings set forth above with respect to doors 18, 20, and 210 apply equally to this enclosure 410.

Modifications and variations of the disclosed embodiments are possible without departing from the scope of the invention defined in the appended claims.

When introducing elements of the present invention or the embodiment(s) thereof, the articles “a”, “an”, “the” and 50 “said” are intended to mean that there are one or more of the elements. The terms “comprising”, “including” and “having” are intended to be inclusive and mean that there may be additional elements other than the listed elements.

As various changes could be made in the above constructions, products, and methods without departing from the scope of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. 60

What is claimed is:

1. An electrical panel enclosure configured to house electrical components, the electrical panel enclosure comprising:

an enclosure body including walls secured to one another and defining an interior space in which the electrical

components are housed, the enclosure body defining an open front side leading to the interior space;

a door hingedly secured to the enclosure body at the front side of the enclosure body, the door including a door panel having a planar door panel body with opposite first and second side edge margins, and a first side door flange extending rearwardly from the first side edge margin of the door panel body and defining a first exterior side of the door, wherein the first side door flange extends at an angle greater than 90 degrees relative to the planar door panel body,

wherein the door further includes a second side door flange extending rearwardly from the second side edge margin of the door panel body and defining a second exterior side of the door, wherein the second side door flange extends at an angle greater than 90 degrees relative to the planar door panel body.

2. The electrical panel enclosure set forth in claim 1, wherein the first side edge margin of the door panel body is hingedly secured to the enclosure body.

3. The electrical panel enclosure set forth in claim 1, wherein the second side edge margin of the door panel body is hingedly secured to the enclosure body.

4. The electrical panel enclosure set forth in claim 1, wherein the door further includes a door gasket secured to an interior perimeter of the door panel body, wherein the door gasket is configured to seal with the enclosure body at the front side of the enclosure body when the door is in a closed position.

5. The electrical panel enclosure set forth in claim 4, wherein the enclosure body defines a door frame at the front side of the enclosure body, the gasket configured to seal with the door frame when the door is in the closed position.

6. The electrical panel enclosure set forth in claim 1, wherein the door constitutes a first door, the electrical panel enclosure further comprising a second door hingedly secured to the enclosure body at the front side of the enclosure body, the second door including a second door panel having a planar second door panel body with opposite first and second side edge margins, and a first side door flange of the second door extending rearwardly from the first side edge margin of the second door panel body, wherein the second side door flange of the second door panel extends at an angle greater than 90 degrees relative to the second planar 45 door panel body.

7. The electrical panel enclosure set forth in claim 6, wherein the first side door flanges of the first and second doors generally oppose one another when the first and second doors are in a closed position.

8. The electrical panel enclosure set forth in claim 7, wherein the first side door flanges of the first and second doors define a generally V-shaped channel when the first and second doors are in the closed position.

9. The electrical panel enclosure set forth in claim 8, wherein the second door includes a second side door flange extending rearwardly from the second side edge margin of the second door panel body, wherein the second side door flange of the second door extends at an angle greater than 90 degrees relative to the second door panel body.

10. The electrical panel enclosure set forth in claim 9, wherein the second side edge margin of each of the first and second door panel bodies is hingedly secured to the enclosure body.

11. The electrical panel enclosure set forth in claim 9, wherein the first door further includes a first door gasket secured to an interior perimeter of the first door panel body, wherein the first door gasket is configured to seal with the



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enclosure body at the front side of the enclosure body when the first door is in a closed position, wherein the second door further includes a second door gasket secured to an interior perimeter of the second door panel body, wherein the second door gasket is configured to seal with the enclosure body at the front side of the enclosure body when the second door is in a closed position.

12. The electrical panel enclosure set forth in claim 11, wherein the enclosure body defines a first door frame at the front side of the enclosure body, the first door gasket configured to seal with the first door frame when the first door is in the closed position, wherein the enclosure body defines a second door frame at the front side of the enclosure body, the second door gasket configured to seal with the second door frame when the second door is in the closed position.

13. The electrical panel enclosure set forth in claim 12, wherein the first and second door frames are partially defined by a center frame post.

14. The electrical panel enclosure set forth in claim 13, wherein the center frame post includes a rear wall and opposite first and second side walls extending forward from the rear wall of the center frame post defining a heightwise channel, wherein the first side door flange of the first door is received in the heightwise channel when the first door is in a closed position, wherein the first side door flange of the

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second door is received in the heightwise channel when the second door is in a closed position.

15. The electrical panel enclosure set forth in claim 14, wherein the center frame post further includes first and second return flanges extending toward one another from front ends of the respective opposite first and second side walls of the center frame post.

16. The electrical panel enclosure set forth in claim 11, further comprising a baffle secured to the enclosure body, wherein the baffle is disposed between the first door gasket and the first side door flange of the first door to impede liquid flow toward the first door gasket when the first door is in the closed position, wherein the baffle is disposed between the second door gasket and the second side door flange of the second door to impede liquid flow toward the second door gasket when the second door is in the closed position.

17. The electrical panel enclosure set forth in claim 16, wherein the baffle defines a channel extending heightwise, wherein the first side door flanges are received in the channel of the baffle when the first and second door are in the closed positions.

18. The electrical panel enclosure set forth in claim 1, wherein the first side door flange is disposed outside the interior space of the enclosure body when the door is closed.

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